

COPELAND HERMETIC COMPRESSORS

# Copeland helps equipment manufacturer achieve ENERGY STAR requirements

## *Testing and optimization of a two-door standalone, reach-in freezer.*

### Customer

A major U.S. refrigerated foodservice equipment manufacturer.

### Challenge

Tougher energy efficiency regulations have left many manufacturers struggling to improve system performance. Some of the most stringent energy requirements fall on refrigerated foodservice equipment, such as standalone refrigerators and freezers. Many original equipment manufacturers (OEMs) have already incorporated high-efficiency component options such as high-efficiency condensing units and electronically commutated evaporator fan motors (ECM). In addition, many OEMs want to achieve ENERGY STAR performance to compete in the market. This leaves few cost-effective design options remaining.

The standalone, reach-in freezer with two solid doors was a popular model, but changing energy expectations had made the design non-competitive with other freezers on the market. The system was already leveraging high-efficiency R-290 refrigerant.

Copeland's test labs have confirmed that R-290 yields more than 20 percent average energy-efficiency improvements compared to R-404A, a commonly used hydrofluorocarbon (HFC) refrigerant targeted for phase-down.

### Solution

Copeland was able to test and optimize a two-door, standalone, reach-in freezer in just a few weeks. The lab first ran a CEC-400 Baseline Energy Efficiency Test and also tested to ASHRAE 72/ARI-1200 Standards as well as 10CFR Section 431.64. The lab carefully collected data over a 24-hour period and reported on energy, temperatures and pressures. Then, our engineers analyzed the data and compared the results to the energy standards such as CEC, ENERGY STAR, and NRCan.

The reach-in unit that we recently tested failed to meet current ENERGY STAR requirements, and just barely met federal DOE energy-efficiency requirements. A drop-in R-290 variable speed compressor and drive significantly improved energy efficiency. The result was a 13% reduction in energy savings and a unit which passed ENERGY STAR standards.

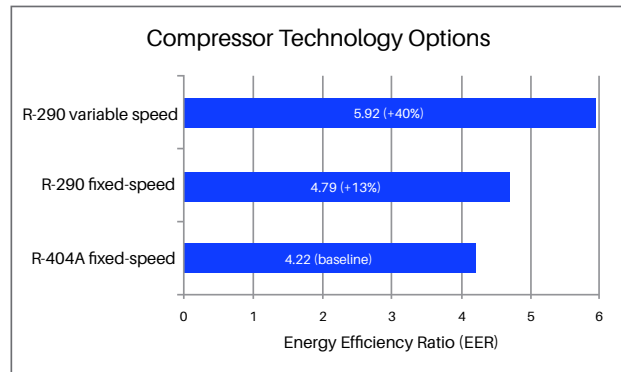
Precise temperature control and significant energy savings are now available with Copeland variable-speed reciprocating hermetic compressors. Building on the field-proven Copeland reciprocating hermetic compressors platform, the variable-speed compressor and drive delivers superior cooling and energy efficiency in scientific, medical, industrial, foodservice and food retail applications.

Copeland reciprocating hermetic compressors provide cost-effective solutions to systems requiring a wide range of evaporating capability. More than 300 models of variable-speed and fixed-speed compressors are available from Copeland, including low-, medium- and high-temperature models for foodservice, ice machines, soft-serve machines, frozen carbonated beverage machines, air dryers and beverage dispensers.

The new design reduces annual power consumption by 13%. The natural refrigerant has an ultra-low global warming potential (GWP) of 3. The compressor cycles on and off less, which reduces wear and tear on components. Freezer temperature can be held precisely after a fast pulldown.

## Result

- Standalone, reach-in freezer optimized and tested with Copeland components and controls
- System efficiency increased by 13% by replacing the fixed-speed compressor with a variable-speed solution
- Compressor cycling reduced by 90%
- Compression ratio relaxed by as much as 43%
- Manufacturer exceeds ENERGY STAR performance levels
- Future-proof, low-GWP natural refrigerant



Note: \* Capacity shown at low temperature -10/110 rating point. Variable speed at 3900 RPM for comparison. Compressor capacity range is 1600-5000 RPM.

To learn more, visit [copeland.com](https://www.copeland.com)

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